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TITLE OF THE INVENTION

METHOD FOR PRODUCING CHARGEABLE POWDER FOR CIRCUIT FORMATION

DETAILED DESCRIPTION OF THE INVENTION

[0005]

[Object of the Invention]

According to the above-described conventional method for producing chargeable powder for circuit formation, it is difficult to uniformly disperse the fine metal particles in thermofusible resin at the kneading. Thus, after crushing and classification, a great amount of fine metal particles 1 are contained in the chargeable powder as shown in FIG. 4(A), a very small amount of fine metal particles 1 are contained therein as shown in FIG. 4(B), or no fine metal particles 1 are contained therein as shown in FIG. 4(C).

[0006]

If the wiring pattern is formed by the electrophotography using such chargeable powder, the charged state of the chargeable powder becomes non-uniform and development of a static latent image also becomes non-uniform.

[0007]

As a result, "fog" occurs in the wiring pattern, which causes short in the wiring and reduction in the insulation resistance, or "break" and "fading" occur in the wiring

pattern, which cause break in the wiring and increase in the insulation resistance.

[0008]

An object of the present invention is to provide a method for producing chargeable powder for circuit formation, capable of making content of the fine metal particles and charge control agent to the chargeable powder more uniform than the prior art and obtaining a uniform wiring pattern in order to solve the abve-described problems.

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[0011]

FIG. 1 is a flowchart of steps of the method for producing chargeable powder for circuit formation according to an example of the present invention.

[0012]

First, fine metal particles, fine particles of thermofusible resin, and fine particles of a charge control agent, which are materials of the chargeable powder, are mixed.

[0013]

At this time, flaky silver powder having an average grain size of 0.5 $\mu$m is used as fine metal particles, fine particles made to have an average grain size of about 0.5 $\mu$m by crushing a styrene-acryl copolymer and a low-molecular-weight polypropylene by a jet mill are used as the thermofusible resin particles, and metal-containing azo-based dye having an average grain size of 0.4 $\mu$m is used the charge control agent particles.

[0014]

They are mixed at a weight ratio of 80:19 (styrene-acryl copolymer : low-molecular-weight polypropylene = 18:1) : 1 and uniformly dispersed by a high-speed mixer (STEP 11). Uniformity of content of fine metal particles to the chargeable powder particles is substantially determined in this step, and becomes preferable as the average grain size of each material is smaller.

[0015]

Next, they are put into a mold, and heated and pressurized by a heating-type pressing machine to obtain a pressed product (STEP 12).

[0016]

Next, the pressed product is roughly crushed by a cutter mill (STEP 13) and finely crushed by a jet mill (STEP 14). Subsequently, the crushed particles are classified (STEP 15) and chargeable powder having an average grain size of about 15 $\mu$m is thereby obtained. FIG. 2 is an illustration of the chargeable powder particle. The fine metal particles 1 and the charge control agent 3 particles are uniformly dispersed in the thermofusible resin particle.